

CLAIMS

We claim:

1. A stackable vehicle light device comprising:

5 a stackable housing;

a reflector coupled to the stackable housing, the reflector having a light emitting surface;

and

at least one light emitting semiconductor device positioned within the stackable housing,

the at least one light emitting semiconductor device arranged to emit light rays off the light

10 emitting surface of the reflector.

2. The stackable vehicle light device of claim 1, wherein the at least one light emitting semiconductor device is a light emitting diode (LED).

15 3. The stackable vehicle light device of claim 1, further comprising at least one connector interconnected with the stackable housing, the at least one connector adapted to interconnect the stackable housing with at least one other stackable housing of another stackable vehicle light device.

20 4. The stackable vehicle light device of claim 3, wherein the at least one connector adapted to interconnect the stackable housing with the at least one other stackable housing of another stackable vehicle light device is a connector means selected from the group consisting of a fastener, a snapping mechanism, and an adhesive.

5. The stackable vehicle light device of claim 1, further comprising at least one thermal conductor positioned within the stackable housing.

6. The stackable vehicle light device of claim 1, wherein the reflector has a first end,
5 a second end, and a curvedly raised portion between the first end and the second end.

7. The stackable vehicle light device of claim 6, wherein the stackable housing has two sides each having an inner surface, and wherein a first light emitting semiconductor device is mounted to the inner surface of one side and a second light emitting semiconductor device is
10 mounted to the inner surface of the other side such that the first and second light emitting semiconductor devices emit light rays toward each other.

8. The stackable vehicle light device of claim 7, wherein the first end of the reflector is coupled to the inner surface of one side of the stackable housing and the second end of the
15 reflector is coupled to the inner surface of the other side of the stackable housing such that the first and second light emitting semiconductor devices emit light rays off the curvedly raised portion.

9. The stackable vehicle light device of claim 1, further comprising a side reflector
20 positioned within a cut-out of the reflector such that the at least one light emitting semiconductor device emits light rays off the side reflector.

10. The stackable vehicle light device of claim 9, wherein the side reflector is a compound parabolic concentrator.

11. The stackable vehicle light device of claim 9, wherein the stackable housing has two sides each having an inner surface and a bottom having an inner surface, and wherein a first light emitting semiconductor device is mounted to the inner surface of one side and a second light emitting semiconductor device is mounted to the inner surface of the other side such that the first and second light emitting semiconductor devices emit light rays toward each other, and wherein a third light emitting semiconductor device is mounted to the inner surface of the bottom.

12. The stackable vehicle light device of claim 11, wherein the side reflector has a cut-out through which a portion of the third light emitting semiconductor device extends.

13. The stackable vehicle light device of claim 1, further comprising a projector coupled to the reflector such that the projector refracts light rays emitted from the at least one light emitting semiconductor device.

14. The stackable vehicle light device of claim 13, wherein the projector includes a lens portion and two side portions, and wherein the projector is positioned such that the light rays emitted from the at least one light semiconductor device propagate through the lens portion.

15. The stackable vehicle light device of claim 13, wherein the projector is a cone projector.

16. The stackable vehicle light device of claim 1, wherein the reflector includes
5 optical elements selected from the group consisting of wedges, flutes, Fresnel rings, and grooves.

17. The stackable vehicle light device of claim 1, wherein the reflector has a first portion, a second portion, and a curvedly lowered portion between the first portion and the second portion.

10 18. The stackable vehicle light device of claim 17, wherein the stackable housing has two sides each having an inner surface, and wherein a first light emitting semiconductor device is mounted to the inner surface of one side and a second light emitting semiconductor device is mounted to the inner surface of the other side such that the first and second light emitting
15 semiconductor devices emit light rays toward each other, and wherein the first portion of the reflector has a first cut-out through which a portion of the first light emitting semiconductor device extends and the second portion of the reflector has a second cut-out through which a portion of the second light emitting semiconductor device extends.

20 19. The stackable vehicle light device of claim 18, wherein light rays emitted from the first light emitting semiconductor device reflect off the second portion of the reflector and light rays emitted from the second light emitting semiconductor device reflect off the first portion of the reflector.

20. A modular vehicle light device comprising:
a plurality of light modules stackably arranged in a configuration, the light modules
having:

5 a housing;
a reflector coupled to the housing, the reflector having a light emitting surface;
and
at least one light emitting semiconductor device positioned within the housing, the
at least one light emitting semiconductor device arranged to emit light rays off the light
10 emitting surface of the reflector.

21. The modular vehicle light device of claim 20, wherein the modular vehicle light
device is a light device selected from the group consisting of as a tail lamp, a stop lamp, a license
plate lamp, a headlamp, a fog lamp, an exterior courtesy lamp, and a turn signal lamp.

15 22. The modular vehicle light device of claim 20, wherein the configuration
comprises the plurality of light modules stackably arranged in a matrix.

23. The modular vehicle light device of claim 22, wherein the matrix comprises rows
20 and columns, and wherein seams are formed where the rows intersect the columns.

24. The modular vehicle light device of claim 23, further comprising a light element mounted on at least one seam, the light element being selected from the group consisting of a side reflector, a projector, and a Fresnel lens.

5 25. The modular vehicle light device of claim 20, wherein the configuration comprises the plurality of light modules stackably arranged in a plurality of columns.

26. The modular vehicle light device of claim 25, wherein the plurality of columns are affixed side by side forming a plurality of rows of light modules.

10 27. The modular vehicle light device of claim 20, wherein each light module has a bottom surface and a top surface, and wherein the plurality of light modules are stacked such that the top surface of a given light module contacts the bottom surface of another given light module.

15 28. The modular vehicle light device of claim 20, wherein each light module has two side surfaces, and wherein the configuration comprises the plurality of light modules arranged such that one side surface of a given light module contacts one side surface of another given light module.

20 29. The modular vehicle light device of claim 20, wherein the plurality of light modules comprise a first and a second set of light modules, and wherein the first set of light

modules performs a first function and the second set of light modules performs a second function.

30. The modular vehicle light device of claim 29, wherein the first function is high
5 beam head light lighting and the second function is low beam head light lighting.

31. An automotive headlight comprising:
a plurality of modular vehicle light devices being stackably arranged in a desired
10 configuration, wherein each modular vehicle light device performs as a component of the
automotive headlight so as to provide a lighting arrangement that supplies an ample amount of
light,
thereby providing a light output that meets regulations and standards set forth for exterior
automotive lighting.

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32. A method of providing a multi-function exterior vehicle light device comprising;
stacking a plurality of light modules into a configuration, wherein each light module has:
a housing;
a reflector coupled to the housing, the reflector having a light
20 emitting surface; and
at least one light emitting semiconductor device positioned within
the housing, the at least one light emitting semiconductor device arranged
to emit light rays off the light emitting surface of the reflector; and

providing independent control of the light modules of the configuration.

33. The method of claim 32, wherein stacking the plurality of light modules into the configuration comprises stacking the light modules into an automotive headlight configuration.

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34. The method of claim 32, wherein providing independent control of the light modules of the configuration comprises providing control of a first group of light modules being operable to perform a first function and providing control of a second group of light modules being operable to perform a second function.

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35. The method of claim 34, wherein the first function is high beam head light lighting and the second function is low beam head light lighting.

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